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DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington, D. C. 20314

EP 1110-1-3

Pamphlet
No. 1110-1-3

31 January 1980

Engineering and Design
FLOOD TOLERANT PLANT SPECIES

1. Purpose. The purpose of this Pamphlet is to provide guidance in the identification of plant species capable of tolerating periodic or occasional flooding.

2. Applicability. This is intended to provide preliminary guidance to district resource managers who are interested in revegetation or improvement of flooded habitats, such as reservoir shorelines.

3. Reference. Whitlow, Thomas H. and Harris, Richard W., "Flood Tolerance in Plants: A State-of-the Art Review", Technical Report ADA 075938 National Technical Information Center (NTIS) 5285 Port Royal Road, Springfield, Virginia 22161.

4. Discussion.

a. Shorelines of many Corps of Engineers reservoirs are stripped of vegetation by the cyclic flooding and drawdown that occur during normal reservoir operations. Such areas often are subject to rapid erosion, and are of minimal value as fish and wildlife habitat. The establishment of flood tolerant vegetation on reservoir shorelines may be accomplished by selective pre-impoundment clearing, although this is generally of minimal effectiveness, or through revegetation. Revegetation techniques are usually similar to planting practices developed for forestry, agriculture, or upland erosion control. The greatest impediment to reservoir shoreline revegetation is the identification of plant species which can tolerate the extraordinary wetting and drying conditions of an irrregularly flooded site and the physiological impacts imposed by such conditions.

b. The stresses imposed on plants by flooding are, for the most part, related to depletion of oxygen in the soil. Other factors, such as siltation or wave damage, may also be important in preventing plant establishment and survival. Certain plant species exhibit anatomical or physiological adaptations which allow them to survive periodic flooding, and many of these species have been identified through ecological investigations of swamps, marshes, recently filled impoundments, and other flooded habitats.

c. The listed species in Appendix A are taken from the reference in paragraph 3 above and tabulated according to Corps of Engineer divisions. The listed species have been observed to have some flood tolerance in the

regions indicated. It must be recognized, however, that little experimental revegetation work has been done, and that the lists should be used only for general guidance rather than as strict prescriptions for shoreline revegetation. Further, a variety of factors other than flood tolerance should be taken into account in planning any revegetation effort. These include: depth, duration, and timing of flooding, soil types, shoreline gradient and exposure to wind and wave action, and wildlife and stabilization value of the species planted.

d. The reader will note that the tables in Appendix A vary considerably; that is, some divisions have long species lists including both woody and herbaceous, exotic and native species, while other divisions have only a few native woody species listed. Such inconsistencies and apparent omissions reflect the characteristics of the published scientific literature and the research interests of individual investigators. The absence of a particular species from the tables does not necessarily imply that it is intolerant of flooding, and the reader is advised to refer to the tables for adjacent divisions as well as their own. The reader should also be aware that weedy annual species are included in the tables, and that these may be highly inappropriate, or even deleterious, if introduced into certain environments (e.g., in the vicinity of grazing or agricultural land).

FOR THE CHIEF OF ENGINEERS:

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1 Appendix
Plant Species List